CLAIMS (STATUS)

1. (Currently Amended) A wet etching system for selectively patterning substrates having regions covered with self-assembled monolayers (SAMs), thereby controlling the etch profile, said system comprising:

a) a liquid etching solution comprising a KCN/Oxygen etching composition; and
b) at least one nonpolar additive comprising a compound which is a perfluoroalkanethiol having a general formula selected from the group consisting of $F_3C-(CF_2)_{n-3}-CH_2-CH_2-SH$, $CF_3-(CF_2)_{(n-3)1}-CO-NH-CH_2-CH_2-SH$ or $CF_3-(CH_2)_{(n-1)}-SH$ and is adapted to form an ordered layer on said substrate, added to said liquid etching solution having a higher affinity to the regions of said substrate covered with SAMs than to the other regions of said substrate.

2. (Canceled) The system of claim 1, wherein said liquid etching solution comprises a KCN/Oxygen etching composition.

3. (Canceled) The system of claim 2, wherein said at least one additive is nonpolar and is adapted to form an ordered layer on said substrate.

4. (Canceled) The system of claim 3, wherein said non polar additive comprises a compound having an alkyl chain and a small, polar head group.

5. (Canceled) The system of claim 4, wherein said compound is selected from the group consisting of alcohols, carboxylic acids, amines, sulfates, phosphates and alkanethiols.

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6. (Canceled) The system of claim 1, wherein said compound is 1-octanol.

7. (Canceled) The system of claim 1, wherein said compound is alkanethiol which is a linear alkanethiol of the general formula $HS-(CH_2)_{n-1}-CH_3$, where $6 < n < 24$.

8. (Canceled) The system of claim 1, wherein said compound is an alkanethiol which is a linear alkanethiol of the general formula $HS-(CH_2)_{n-1}-X$, where X = -OH, -COOH, -CN, -Br or vinyl, and $6 < n < 24$.

9. (Canceled) The system of claim 7, wherein said alkanethiol is hexadecanethiol.

10. (Canceled) The system of claim 9, wherein said hexadecanethiol is present in a concentration in the range of about 0.005 mM to about 0.07 mM.

11. (Canceled) The system of claim 1, wherein said compound is an alkanethiol which is a perfluoroalkanethiol.

12. (Cancelled) The system of claim 1, wherein said perfluoroalkanethiol has a general formula selected from the group consisting of $F_3C-(CF_2)_{n-3}-CH_2-CH_2-SH$, $CF_3-(CF_2)_{(n-3)}-CO-NH-CH_2-CH_2-SH$ or $CF_3-(CH_2)_{(n-1)}-SH$).

13. (Cancelled) A wet etching system for selectively patterning substrates having regions covered with self-assembled

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monolayers (SAMs), thereby controlling the etch profile, said system comprising

a) a liquid etching solution comprising a KCN/Oxygen etching composition; and
b) at least one non-polar additive which is a disulfide to said liquid etching solution which is a non-polar and is adapted to form an ordered layer on said substrate having a higher affinity to the regions of said substrate covered with SAMs than to the other regions of said substrate.

14. (Cancelled) The system of claim 1 and claim 13 which contains additionally a second additive.

15. (Cancelled) The system of claim 14, wherein said second additive is a surfactant.

16. (Cancelled) The system of claim 15, wherein said surfactant is a poly(ethyleneglycol).

17. (Cancelled) The system of claim 16, wherein said poly(ethyleneglycol) is dodecylhexa(ethyleneglycol) ($C_{12}PEG_6$).

18. (Cancelled) The system of claim 17, wherein said $C_{12}PEG_6$ is present in a concentration in the range of about 0.5 mM to about 10 mM.

19. (Cancelled) The system of claim 1 and claim 13, wherein said substrate is selected from the group consisting of Au, Ag, Pd and Cu.

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20. (Cancelled) The system of claim 19, wherein said substrate is patterned with a resist.

21. (Cancelled) The system of claim 20, wherein said resist is hydrophobic.

22. (Cancelled) A method for selectively patterning a substrate having regions covered with self-assembled monolayers (SAMs), thereby controlling the etch profile, said method comprising the steps of

a) providing a liquid etching solution;
b) adding at least one additive to said etching solution having a higher affinity to the regions of said substrate covered with SAMs than to the other regions of said substrate; and
c) etching said substrate with said liquid etching solution comprising said at least one additive.

23. (Cancelled) The method according to claim 22, wherein said liquid etching solution comprises a KCN/Oxygen etching composition.

24. (Cancelled) The method according to claim 23, wherein said liquid etching solution is sprayed onto said substrate.

25. (Cancelled) The method according to claim 22, wherein said at least one additive is nonpolar and is adapted to form an ordered layer on said substrate.

26. (Cancelled) The method according to claim 25, wherein said non polar additive comprises a compound having an alkyl chain and a small, polar head group.

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27. (Cancelled) The method according to claim 26, wherein said compound is selected from the group consisting of alcohols, carboxylic acids, amines, sulfates, phosphates and alkanethiols.

28. (Cancelled) The The method according to claim 27, wherein said compound an alcohol which is 1-octanol.

29. (Cancelled) The method according to claim 27, wherein said compound is alkanethiol and is a linear alkanethiol of the general formula $HS-(CH_2)_{n-1}-CH_3$, where $6 < n < 24$.

30. (Cancelled) The method according to claim 27, wherein said compound is an alkanethiol and is a linear alkanethiol of the general formula $HS-(CH_2)_{n-1}-X$, where X = -OH, -COOH, -CN, -Br or vinyl, and $6 < n < 24$.

31. (Cancelled) The method according to claim 29, wherein said alkanethiol is hexadecanethiol.

32. (Cancelled) The method according to claim 31, wherein said hexadecanethiol is present in a concentration in the range of about 0.005 mM to about 0.07 mM, preferably 0.02 mM.

33. (Cancelled) The method according to claim 27, wherein said compound is an alkanethiol which is a perfluoroalkanethiol.

34. (Cancelled) The method according to claim 33, wherein said perfluoroalkanethiol has a general formula selected from the group consisting of $F_3C-(CF_2)_{n-3}-CH_2-CH_2-SH$, $CF_3-(CF_2)_{(n-3)}-CO-NH-CH_2-CH_2-SH$ or $CF_3-(CH_2)_{(n-1)}-SH$.

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35. (Cancelled) The according to claim 25, wherein said non-polar additive is a disulfide.

36. (Cancelled) The method according to claim 22, comprising the step of additionally adding a second additive.

37. (Cancelled) The method according to claim 36, characterized in that said second additive is an additive according to any one of claims 15 to 18.

38. (Cancelled) A method of forming tapered patterns on a substrate having regions covered with self-assembled monolayers (SAMs), wherein said substrate is etched using a wet etching system according to claim 1.

39. (Cancelled) A method of etching a copper substrate having regions covered with self-assembled monolayers (SAMs) with a wet etching system, wherein said wet etching system comprises a first compound being adapted to bind to said copper substrate and to oxidize said copper, and a second compound being adapted to solubilize said oxidized copper.

40. (Cancelled) The method of claim 39, wherein said first compound is 3-nitrobenzenesulfonic acid (sodium salt) (NBSA) and said second compound is polyethyleneimine (PEI).

41. (Cancelled) The method according to claim 40, wherein said PEI is present in the form of large, branched molecules.

42. (Cancelled) The method of claim 39, wherein said first compound or said second compound is large as compared to defects present in said self-assembled monolayer.

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43. (Cancelled) The method of claim 39, wherein the characteristics of said first and said second compound are combined in one single molecule.

44. (Cancelled) The method of claim 39, wherein a copper surface is first patterned with a self-assembled monolayer and etched over a limited depth, and subsequently said etched copper is removed from the etch bath and printed a second time with a planar stamp and then placed back in said etch bath.

45. (Cancelled) The method of claim 44, wherein after the first etch step, the parts of said etched copper surface which are protected by said self-assembled monolayers are covered with a different material to further block the etch of these parts of the copper surface during the second etch step.

46. (Cancelled) The system of claim 9, wherein said hexadecanethiol is present in a concentration of about 0.02 mM.

47. (Cancelled) The system of claim 17, wherein said $C_{12}PEG_6$ is present in a concentration of about 2.0 mM.

In view of the amendments of the claims to correspond to the Examiner's suggestions, allowance of the claims is respectfully requested.

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